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THE POSSIBILITIES FOR GREATER PRODUCTION AND A SMALLER LOADING

Veterinary Station Salmon Research Ltd.

Last fall, different fish farms and administrative bodies approached the Veterinary Station Salmon Research Ltd. in connection with the process of determining the licencing conditions of fish farms. It was especially important to examine how the new and different feed and fish farming technology would affect the environmental impact of a fish farm. The Salmon Research presents the following items to be considered.

Fish feeds

The quota of a fish farm is usually set by determining the tolerance of a given water area toward a given quota. This has most commonly been based on the fact that fish feed contains about 1% of phosphorus and the fish consume feed by an estimated feed conversion factor of

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1.8. Phosphorus binds with the fish at the rate of 4% by weight. The phosphorus loading of the water system caused by the fish farm has been calculated this way.

Phosphorus content is dropping

The recent development in feeds has brought up the following new factors. The phosphorus content of fish feed can be reduced to as low as about 0.4-0.5%, and we can switch to feed with a higher degree of domestic production content. For feed consumption, the coefficient of utilization can be developed technologically, and the feed conversion factor can be estimated to be as good as between 1.0 and 1.3 during the best growing season.

Licences should be conditional on the quantity of phosphorus, not on the quantity of production

If the licence of a fish farm is determined entirely on the basis of a given maximum quota, it is possible that these new environment-friendly brands of feed, or culturing methods that improve the feed conversion factor, are not adopted. This is because other culturing methods will probably be somewhat more economical. In order to encourage a fish farm to apply fish farming improvements, the licences should, if possible, be formulated as follows: A fish farm is allowed to culture X tonnes of fish, or a quantity that does not produce phosphorus loading exceeding loading produced if the corresponding quantity of fish (X tonnes) is cultured using a feed conversion factor of 1.8 and a phosphorus level of 1%. This could be expressed in a more direct way by setting given maximum phosphorus loading limits for the facilities.

The above method can be applied on the condition that the authority has access to the feed accounts of the facility to verify the amount of feed used and that it is also possible for the authority to analyze the feed used, to determine its phosphorus values. If successful, this method would lead to a greater culturing capacity and lower loading effects.

The site of the facility in a marine area should also be taken into consideration. If the facility is close to the open sea and water currents can be expected to carry the excrements of the fish into the archipelago, the following factor should be noted. If wet feed originating in the natural fish stocks of the Baltic Sea is used, phosphorus can be removed from the sea by means of fish farming. Further, the local environmental effects of the wet feed in question can be crucially reduced by switching to semi-moist feed, which would essentially improve the feed conversion factor. Trials on the feeds in question have started, and the objective is to use wet feed at a phosphorus level of 0.3-0.4% and a feed conversion factor of 2.5.

Culturing technology

Even in the marine area, it is possible to use different methods to try to collect the fish excrements. Testing of a certain sludge collection mechanism is being currently considered. The difficulty is the costliness of these methods. However, if licences were to establish a maximum pollution load as an alternative for a maximum quota, development in cleaning methods would likely be encouraged.

Small or large facilities in the marine area

We also ask you to note the following factors. Dividing fish farming into small units along the coast is not an unambiguously good solution.

All units will in such a case be attempting to locate within the shelter afforded by the inner archipelago and at the same time within a range affecting summer vacation housing. A facility that is to be established in the open sea requires a larger unit because the construction and transportation expenses are considerably higher. Also, a small unit cannot invest in technological solutions that reduce the environmental effects described above.

The above is an attempt to outline our opinion of the development of fish farming in the near future, taking into consideration environmental effects. We did not attempt to present detailed factors but to outline the potential of the field. We particularly wanted to show that it is possible to increase fish farming quotas from what they are now and to reduce the environmental pollution loading at the same time. This, however, requires guidance in the field so that new solutions are economically possible. This places a considerable additional responsibility on the control authorities, because the development of fish farming could create new job opportunities in the archipelago, if specific problems such as controlling the feed use of a fish farm can be solved.

Kustavi, 1983-11-11

Kari Korhonen